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Claims

[c1] 1. An expandable bore trocar/cannula, comprising:

-A composite needle forming a cannula shaft and a puncture tip; and

-The composite needle comprising at least one rigid element, and flexible material connected to the at least one rigid element, wherein the rigid elements and the flexible material together form the cannula shaft, and the rigid elements form the puncture tip.

[c2] 2. The device according to Claim 1, wherein the rigid elements comprise a material selected from the group consisting of plastics, ceramics, metals, and combinations and composites thereof.

[c3] 3. The device according to Claim 1, wherein the flexible material comprises a material selected from the group consisting of natural or synthetic elastic material, silicon, rubber, elastomeric neoprene, latex, and elastomeric plastics.

[c4] 4. The device according to Claim 1, wherein the cannula shaft comprises a diameter, wherein the diameter is smaller at a proximal end proximate the puncture tip

than at a distal end distal from the puncture tip.

[c5] 5. The device according to Claim 1, wherein the composite needle comprises four rigid elements.

[c6] 6. The device according to Claim 1, further comprising a fitting into which a distal end of composite needle is inserted, wherein the distal end is distal from the puncture tip, and the fitting includes an access bore that corresponds with a cannula bore formed by the cannula shaft.

[c7] 7. The device according to claim 6, wherein the fitting comprises an insertion recess, wherein the insertion recess is configured to connect to fluid-insertion devices.

[c8] 8. An expandable bore trocar/cannula, comprising:
-An expandable cannula body, wherein the cannula body has an interior channel with a diameter, wherein the cannula body is capable of flexing so as to increase or decrease the diameter of the cannula body; and
-Means for inserting the cannula body into a patient.

[c9] 9. The device according to Claim 8, wherein the cannula body comprises a composite needle having at least one rigid element, and flexible material connected to the at least one rigid element, wherein the rigid element and the flexible material together form the cannula body, and the inserting means comprise the rigid elements,

which form a puncture tip.

[c10] 10. The device according to Claim 8, wherein inserting means comprises a stylet configured for insertion into and withdrawal from the interior channel of the cannula body.

[c11] 11. An expandable bore trocar/cannula, comprising:
-An expandable cannula body, wherein the cannula body has an interior channel with a diameter, wherein the cannula body is capable of flexing so as to increase or decrease the diameter of the cannula body; and
-A stylet configured for insertion into, and withdrawal from the interior channel.

[c12] 12. The device according to Claim 11, wherein the cannula body comprises a composite needle having at least one rigid element, and flexible material connected to the at least one rigid element, wherein the rigid element and the flexible material together form the cannula body.

[c13] 13. The device according to Claim 11, wherein the cannula body comprises at least two rigid elements.

[c14] 14. The device according to Claim 13, wherein the cannula body comprises four rigid elements.

[c15] 15. The device according to Claim 11, wherein the can-

nula body comprises an expandable spring cannula, the spring cannula comprising at least one rigid element formed in the shape of a helix and having a center channel, and a flexible material attached to the rigid element to form at least a portion of a cylinder surrounding the center channel.

[c16] 16. The device according to claim 11, wherein the cannula body comprises a rotating cannula, the rotating cannula having at least a first and a second rigid element which comprise a portion of a cylinder arc, the first and second rigid elements being concentric to a center line of the rotating cannula, with the second rigid element being capable of rotating around the center line.

[c17] 17. The device according to claim 11, wherein the cannula body comprises a ribbon spring, the ribbon spring comprising at least one rigid element formed in the shape of a helix and having a center channel.

[c18] 18. The device according to claim 11, wherein the cannula body comprises a rolled cannula, the rolled cannula comprising at least one sheet of rigid material having a first longitudinal side and a second longitudinal side, the sheet being formed into the shape of a cylinder and having a center channel with a diameter, the sheet overlapping at the first and second longitudinal sides so as to

allow the diameter to be varied.

[c19] 19. A medical insertion device for use with one of a trocar and a cannula, comprising:

-A delivery apparatus having a delivery shell configured to be grasped by a user;

-Wherein the delivery shell includes a channel, and a nose extending outward from the shell, the nose having a bore therethrough aligned with the channel, wherein the channel and bore are configured for insertion of the trocar or cannula therethrough; and

-The delivery apparatus further comprising a withdrawal mechanism proximate the channel, which is configured to cooperate with a retraction head of the trocar or cannula, and which includes at least one handle, wherein the handle facilitates the passage of the trocar or cannula through the channel and bore, and out of the delivery apparatus through the nose.